

Subpart CC Technical Resource Document

EPA Region 4 Compliance Assistance

Waste Management Division
RCRA Enforcement & Compliance Branch
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Definitions for Subpart CC

Average volatile organic concentration or average VO concentration means the mass-weighted average volatile organic concentration of a hazardous waste as determined in accordance with the requirements of §265.1084 of this subpart.

Closure device means a cap, hatch, lid, plug, seal, valve, or other type of fitting that blocks an opening in a cover such that when the device is secured in the closed position it prevents or reduces air pollutant emissions to the atmosphere. Closure devices include devices that are detachable from the cover (e.g., a sampling port cap), manually operated (e.g., a hinged access lid or hatch), or automatically operated (e.g., a spring-loaded pressure relief valve).

Continuous seal means a seal that forms a continuous closure that completely covers the space between the edge of the floating roof and the wall of a tank. A continuous seal may be a vapor-mounted seal, liquid-mounted seal, or metallic shoe seal. A continuous seal may be constructed of fastened segments so as to form a continuous seal.

Cover means a device that provides a continuous barrier over the hazardous waste managed in a unit to prevent or reduce air pollutant emissions to the atmosphere. A cover may have openings (such as access hatches, sampling ports, gauge wells) that are necessary for operation, inspection, maintenance, and repair of the unit on which the cover is used. A cover may be a separate piece of equipment which can be detached and removed from the unit or a cover may be formed by structural features permanently integrated into the design of the unit.

Enclosure means a structure that surrounds a tank or container, captures organic vapors emitted from the tank or container, and vents the captured vapors through a closed-vent system to a control device.

External floating roof means a pontoon-type or double-deck type cover that rests on the surface of the material managed in a tank with no fixed roof.

Fixed roof means a cover that is mounted on a unit in a stationary position and does not move with fluctuations in the level of the material managed in the unit.

Floating membrane cover means a cover consisting of a synthetic flexible membrane material that rests upon and is supported by the hazardous waste being managed in a surface impoundment.

Floating roof means a cover consisting of a double deck, pontoon single deck, or internal floating cover which rests upon and is supported by the material being contained, and is equipped with a continuous seal.

Hard-piping means pipe or tubing that is manufactured and properly installed in accordance with relevant standards and good engineering practices.

In light material service means the container is used to manage a material for which both of the following conditions apply: the vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kilopascals (kPa) at 20 °C; and the total concentration of the pure organic constituents having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight.

Internal floating roof means a cover that rests or floats on the material surface (but not necessarily in complete contact with it) inside a tank that has a fixed roof.

Liquid-mounted seal means a foam or liquid-filled primary seal mounted in contact with the hazardous waste between the tank wall and the floating roof continuously around the circumference of the tank.

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control

equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Maximum organic vapor pressure means the sum of the individual organic constituent partial pressures exerted by the material contained in a tank, at the maximum vapor pressure-causing conditions (i.e., temperature, agitation, pH effects of combining wastes, etc.) reasonably expected to occur in the tank. For the purpose of this subpart, maximum organic vapor pressure is determined using the procedures specified in §265.1084(c) of this subpart.

Metallic shoe seal means a continuous seal that is constructed of metal sheets which are held vertically against the wall of the tank by springs, weighted levers, or other mechanisms and is connected to the floating roof by braces or other means. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

No detectable organic emissions means no escape of organics to the atmosphere as determined using the procedure specified in §265.1084(d) of this subpart.

Point of waste origination means as follows:

(1) When the facility owner or operator is the generator of the hazardous waste, the point of waste origination means the point where a solid waste produced by a system, process, or waste management unit is determined to be a hazardous waste as defined in 40 CFR part 261.

[Note: In this case, this term is being used in a manner similar to the use of the term “point of generation” in air standards established for waste management operations under authority of the Clean Air Act in 40 CFR parts 60, 40 CFR 61, and 40 CFR 63].

(2) When the facility owner and operator are not the generator of the hazardous waste, point of waste origination means the point where the owner or operator accepts delivery or takes possession of the hazardous waste.

Point of waste treatment means the point where a hazardous waste to be treated in accordance with §265.1083(c)(2) of this subpart exits the treatment process. Any waste determination shall be made before the waste is conveyed, handled, or otherwise managed in a manner that allows the waste to volatilize to the atmosphere.

Safety device means a closure device such as a pressure relief valve, frangible disc, fusible plug, or any other type of device which functions exclusively to prevent physical damage or permanent deformation to a unit or its air emission control equipment by venting gases or vapors directly to the atmosphere during unsafe conditions resulting from an unplanned, accidental, or emergency event. For the purpose of this subpart, a safety device is not used for routine venting of gases or vapors from the vapor headspace underneath a cover such as during filling of the unit or to adjust the pressure in this vapor headspace in response to normal daily diurnal ambient temperature fluctuations. A safety device is designed to remain in a closed position during normal operations and open only when the internal pressure, or another relevant parameter, exceeds the device threshold setting applicable to the air emission control equipment as determined by the owner or operator based on manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials.

Single-seal system means a floating roof having one continuous seal. This seal may be vapor-mounted, liquid-mounted, or a metallic shoe seal.

Vapor-mounted seal means a continuous seal that is mounted such that there is a vapor space between the hazardous waste in the unit and the bottom of the seal.

Volatile organic concentration or **VO concentration** means the fraction by weight of the volatile organic compounds contained in a hazardous waste expressed in terms of parts per million (ppmw) as determined by direct measurement or by knowledge of the waste in accordance with the requirements of §265.1084 of this subpart. For the purpose of determining the VO concentration of a hazardous waste, organic compounds with a Henry's law constant value of at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in the liquid-phase (0.1 Y/X) (which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³) at 25 degrees Celsius must be included. Appendix VI of this subpart presents a list of compounds known to have a Henry's law constant value less than the cutoff level.

Waste determination means performing all applicable procedures in accordance with the requirements of §265.1084 of this subpart to determine whether a hazardous waste meets standards specified in this subpart. Examples of a waste determination include performing the procedures in accordance with the requirements of §265.1084 of this subpart to determine the average VO concentration of a hazardous waste at the point of waste origination; the average VO concentration of a hazardous waste at the point of waste treatment and comparing the results to the exit concentration limit specified for the process used to treat the hazardous waste; the organic reduction efficiency and the organic biodegradation efficiency for a biological process used to treat a hazardous waste and comparing the results to the applicable standards; or the maximum volatile organic vapor pressure for a hazardous waste in a tank and comparing the results to the applicable standards.

Waste stabilization process means any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids as determined by Test Method 9095 (Paint Filter Liquids Test) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference—refer to §260.11 of this chapter). A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are "waste fixation" or "waste solidification." This does not include the adding of absorbent materials to the surface of a waste, without mixing, agitation, or subsequent curing, to absorb free liquid.

Exceptions

Waste management units holding hazardous waste prior to 10/6/96 **AND** no hazardous waste had been added after 10/6/96 (active management of the unit).

A container smaller than 0.1 m³ (i.e., 26.42 gallons).

Tank no longer receiving hazardous and is undergoing closure (approved closure plan).

A surface impoundment no longer receiving hazardous and is undergoing closure (approved closure plan).

Waste management unit used solely for on-site treatment or storage of hazardous waste which was generated from remedial activities (RCRA 3008(h) or CERCLA).

Any waste management unit which handles mixed waste. (Mixed waste is hazardous waste with Rad waste).

A hazardous waste management unit certified that it is equipped with and operates air emission controls under the Clean Air Act, 40 CFR Parts 60, 61, and 63.

A Tank that has a process vent (see § 264.1031 definition below).

Process Vent Any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottom receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam-stripping operations.

Subpart CC Flow Diagrams

Applicability

Containers

Level 1 Standards

Level 2 Standards

Level 3 Standards

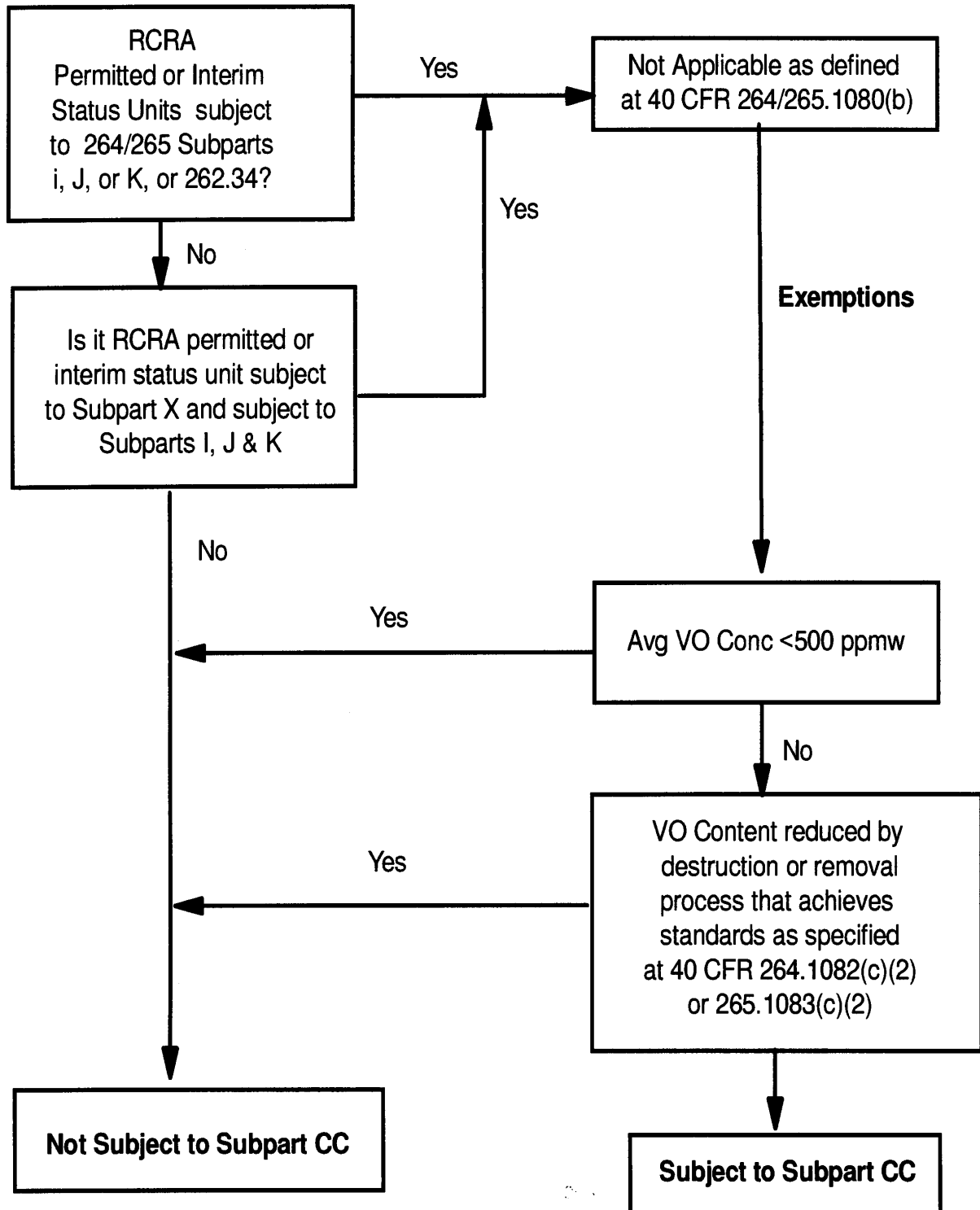
Tanks

Level 1 Controls

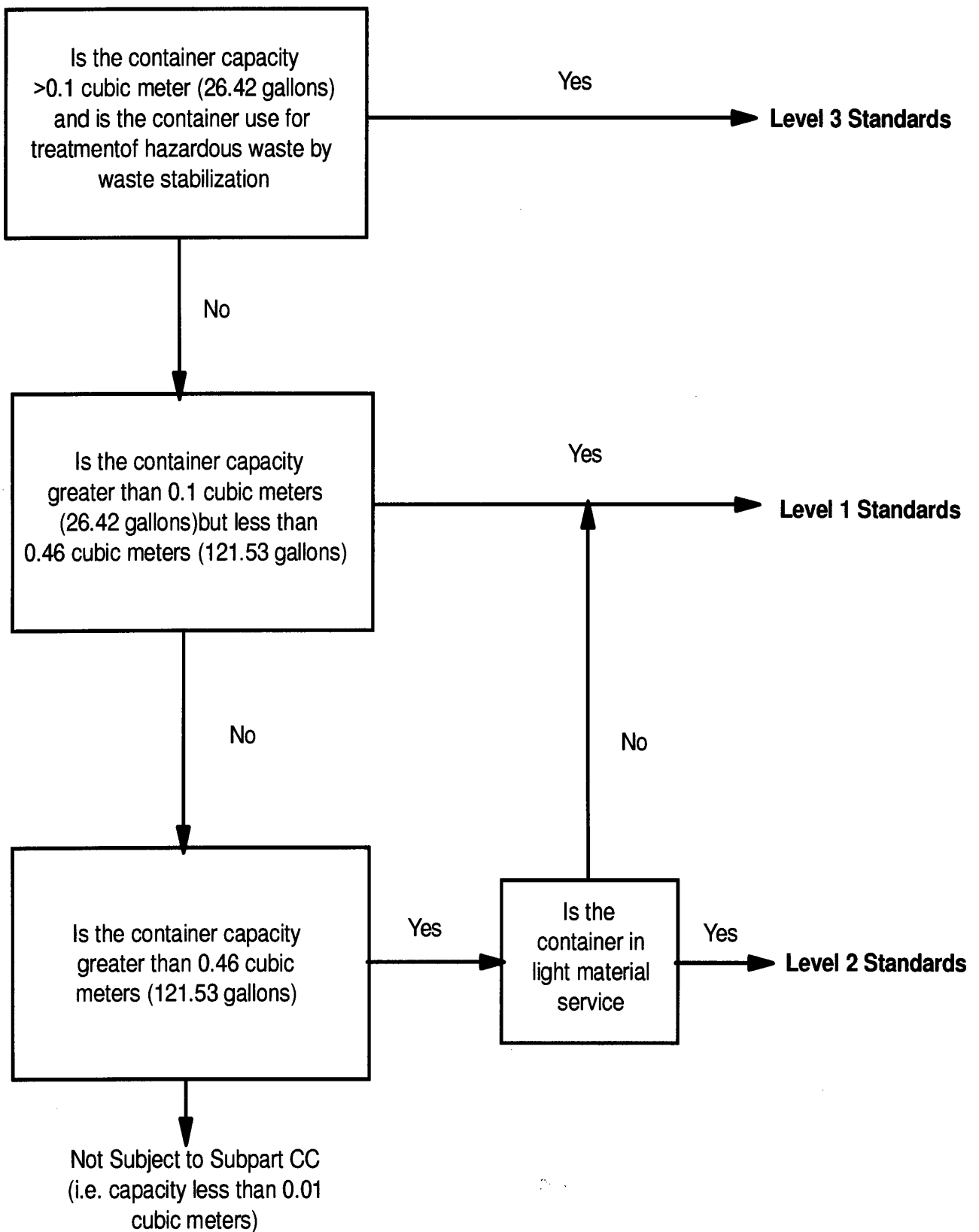
Level 2 Controls

Surface Impoundments

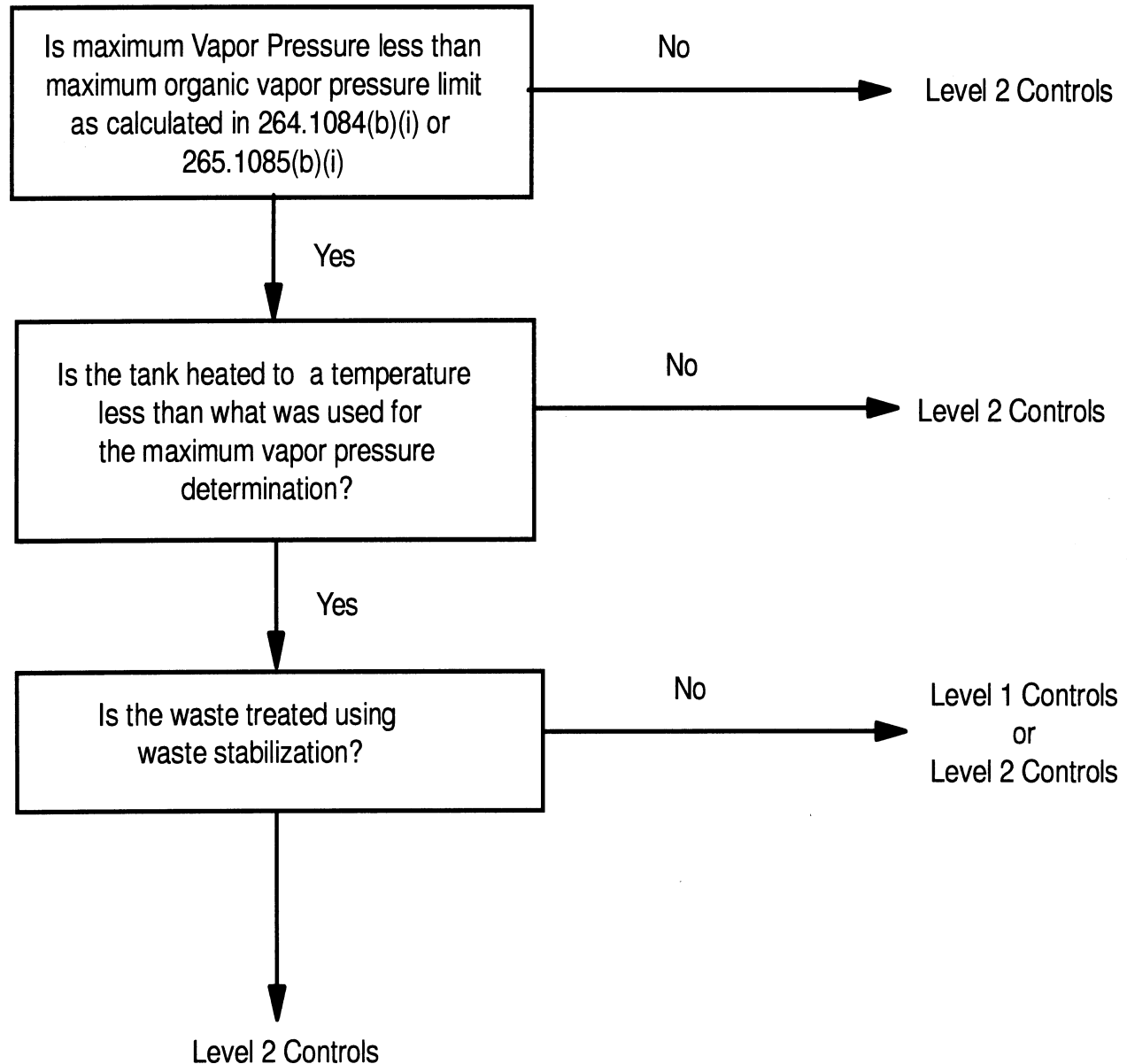
Applicability



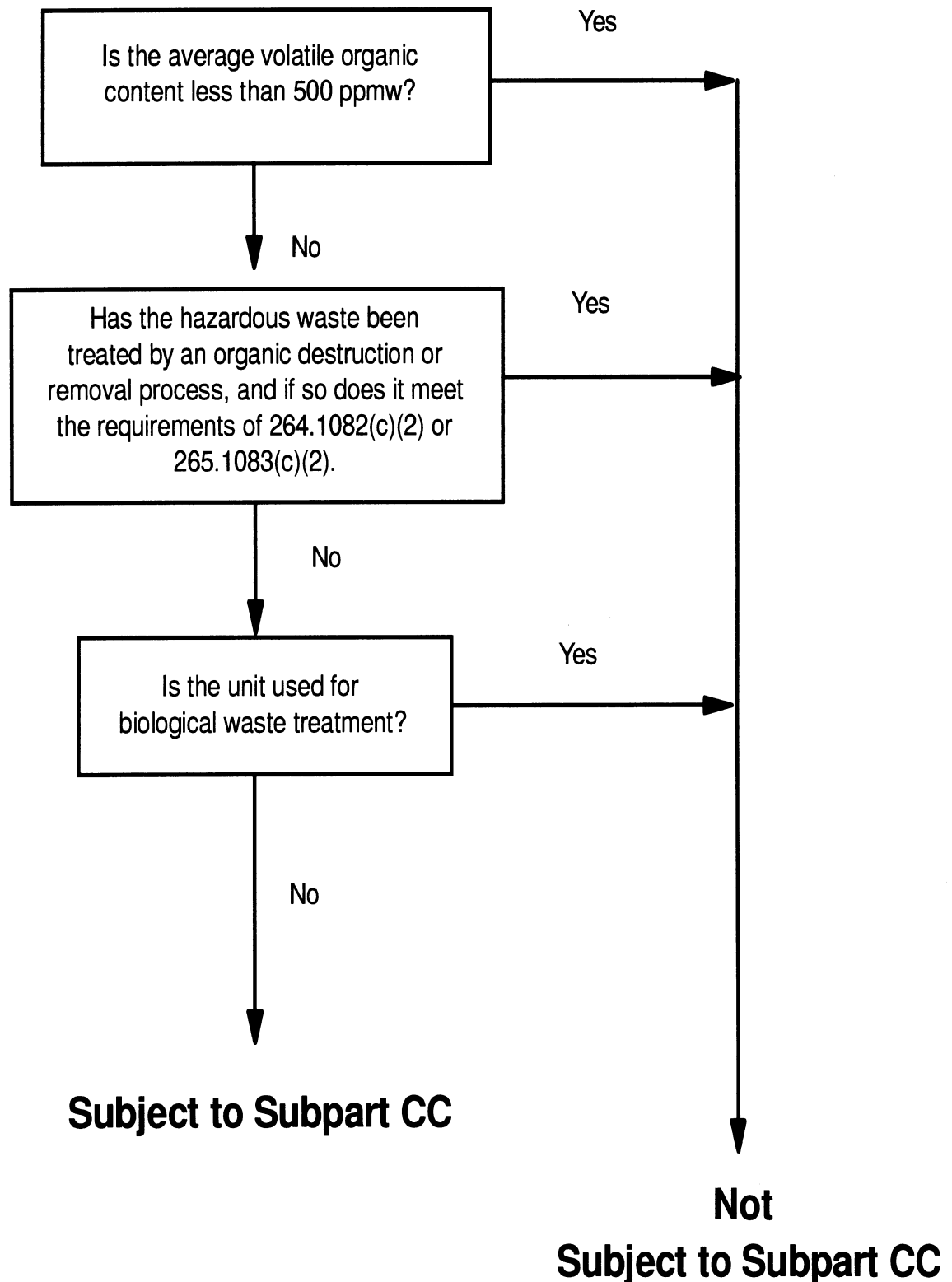
Containers: Level of Control Standards



Tanks: Level of Control



Surface Impoundments: Applicability



Control Standards for Containers

Level 1 Control	Level 2 Control	Level 3 Control
<p>Must consist of one of the following</p> <ol style="list-style-type: none"> 1. Meet the applicable DOT standards 264.1086(f) or 265.1087(f). or 2. Container must be equipped with a visible cover and closure device that form a continuous seal with no visible holes. or 3. Open top container in which an organic-vapor suppressing barrier is placed on or over hazardous waste such that no hazardous waste is exposed to the atmosphere. <p>Containers shall be equipped with covers and closure devices, composed of suitable materials to minimize exposure of hazardous waste to the atmosphere and maintain integrity as required at 264.1086(c)(2) or 265.1087(c)(2).</p> <p>Owner/operator shall maintain cover and closure devices in a closed position except to add or remove hazardous waste, perform routine activities, or to maintain internal pressure as required at 264.1086(c)(3)(iv) or at 265.1087(c)(3)(iv), or for safety reasons as specified at 264.1086(c)(3)(v) and 265.1087(c)(3)(v).</p> <p>Owners/operators shall inspect containers. 264.1086(c)(4), 265.1087(c)(4)</p> <p>Owners/operators must maintain copies of procedures used to determine that containers with capacity of 0.46 m³ are not managing hazardous waste in light material service</p>	<p>Must consist of one of the following</p> <ol style="list-style-type: none"> 1. Meet the applicable DOT standards 264.1086(f) or 265.1087(f). or 2. Operates with no detectable organic emissions as defined in 264.1081 or 265.1081. or 3. Has been demonstrated within preceding 12 months to be vapor tight by means of Method 27, 40 CFR Part 60, Appx A <p>Transfer of hazardous waste in or out of controlled containers shall be performed to minimize exposure of hazardous waste to the atmosphere.</p> <p>Owner/operator shall maintain cover and closure devices in a closed position except to add or remove hazardous waste, perform routine activities, or to maintain internal pressure as required at 264.1086(d)(3)(iv) or at 265.1087(d)(3)(iv), or for safety reasons as specified at 264.1086(d)(3)(v) and 265.1087(d)(3)(v).</p> <p>Owners/operators shall inspect containers. 264.1086(c)(4), 265.1087(c)(4)</p> <p>Owners/operators must maintain copies of procedures used to determine that containers with capacity of 0.46 m³ are not managing hazardous waste in light material service</p>	<p>Must consist of one of the following</p> <ol style="list-style-type: none"> 1. Vented directly through a closed vent system (CVS) to control device (CD). or 2. Vented inside an enclosure which is exhausted through a CVS to a CD <ul style="list-style-type: none"> •The container enclosure shall be designed and operated in accordance with the criteria for permanent enclosure as specified under Procedure T of 40 CFR § 52.741, Appendix B and •The CVS and CD shall be designed and operated in accordance with 264.1087 or 265.1088. Safety devices as defined at § 264.1081 or § 265.1081, may be installed and operated as necessary on any container, CVS, CD or enclosure. <p>Owners/operators shall inspect and monitor the CVS and CD 264.1087, 265.1088</p> <p>Owners/operators must prepare and maintain records specified in §264.1089(d) or § 265.1090(d).</p>

Control Standards for Tanks

Level 1 Control	Level 2 Control		
<p>Determine maximum vapor pressure in tank by means of § 264.1083(c) or § 265.1084(c)</p> <p>Equip tank with fixed roof with no visible cracks, holes, gaps, or other open spaces in roof seams.</p> <p>Fixed roof opening must be equipped with a closure device designed with no visible cracks, holes, gaps, or other open spaces, or a permanent opening vented to an organics emissions control device.</p> <p>Closure device must be maintained in closed position except when necessary to access waste or equipment under the cover.</p> <p>Pressure relief devices which vent to the atmosphere, the opening of which is allowed during normal operation for the purpose of maintaining normal tank pressure, shall be designed with no detectable organic emissions.</p> <p>Opening of a safety device (defined at § 264.1081 or § 265.1081) is allowed to avoid an unsafe condition.</p> <p>Owner/operator must inspect air emission control equipment as required by § 264.1084(c)(4) or § 265.1085(c)(4).</p>	<p>Option 1-Fixed roof with internal floating roof</p> <p>Internal floating roof shall be designed to float on liquid surface unless on leg support and to meet the requirements of § 264.1084(f)(1)(ii)-(iii) or § 265.1085(f)(1)(ii)-(iii)</p> <p>Owner/operator must operate the tank according to the specified practices at § 264.1084(e)(2) or § 265.1085(e)(2)</p> <p>Owner/operator must inspect the internal floating roof by the specified means located at § 264.1084(e)(3) or § 265.1085(e)(3).</p>	<p>Option 3-cover vented to a control device</p> <p>The tank shall be covered by a fixed roof and vented through a CVS to a CD to form a continuous barrier over entire liquid surface. Each opening not vented to the CD shall be equipped with a closure device. The CVS and CD must be operated according to the specifications of § 264.1087 or § 265.1088</p> <p>When hazardous waste is in the tank, the fixed roof must be installed with each closure device secured in a closed position and the vapor headspace vented to a CD.</p> <p>Owner/operator must inspect the internal floating roof by the specified means located at § 264.1084(g)(3) or § 265.1085(g)(3).</p>	<p>Option 5-tank inside enclosure vented to combustion CD</p> <p>Tank inside enclosure must be designed and operated as specified for criteria for permanent total enclosure. § 264.1084(i)(1) or § 265.1085(i)(1).</p> <p>Enclosure shall be vented through a CVS to an enclosed combustion CD that is designed and operated according to the parameters specified in § 264.1087 or § 265.1088</p> <p>Safety devices may be installed and operated as necessary on enclosures, CVS or CD.</p> <p>Owner/operators must inspect the CVS and CD according to the specifications of § 264.1087 or § 265.1088</p>
	<p>Option 2-external floating roof</p> <p>External floating roof shall be designed to float on liquid surface unless on leg supports, be equipped with two continuous seals and meet requirements of § 264.1084(f)(1)(iii) or § 265.1085(f)(1)(iii)</p> <p>Owner/operator must operate the tank according to the specified practices at § 264.1084(f)(2) or § 265.1085(f)(2)</p> <p>Owner/operator must inspect the internal floating roof by the specified means located at § 264.1084(f)(3) or § 265.1085(f)(3).</p>	<p>Option 4-pressure tank</p> <p>The tank must be designed not to vent to atmosphere as a result of vapor headspace compression during filling.</p> <p>Openings must be equipped with closure devices designed to operate with no detectable emissions as specified at § 264.1083(d) or § 265.1084(d)</p> <p>When hazardous waste is in the tank, the tank must be operated as a closed system that does not vent to the atmosphere unless a safety device release is required.</p>	

Control Standards for Surface Impoundments

<p>Floating Membrane Option</p> <p>Floating membrane must be designed to float on liquid surface, be fabricated from HDPE or equivalent (see § 264.1085(c)(1)(ii)(B) or § 265.1086(c)(1)(ii)(B)), installed with no visible cracks, equipped with closure devices which meet the physical specifications and performance requirements.</p> <p>When hazardous waste is in the unit, the membrane shall be installed with each closure device secured in a closed position except as allowed under § 264.1085(c)(2) or § 265.1086(c)(2).</p> <p>Owner/operator shall inspect the unit § 264.1085(g)(2) or § 265.1086(g)(3).</p>	<p>Cover System with Venting to CVS and CD</p> <p>Cover and closure system devices shall be designed to form a continuous barrier.</p>	
	<p>If the CVS CD operates under negative pressure</p>	<p>If the CVS CD operates under positive pressure</p>
	<p>Cover must be designed with no visible cracks, etc., and closure devices secured in closed position, except when necessary to access waste or equipment under the cover.</p>	<p>Cover designed to operate with no detectable emissions when all closure devices are secured into closed, sealed position and closure devices maintained in a closed position except when necessary to access waste or equipment under the cover.</p>
	<p>When hazardous waste is in the unit, cover shall be installed with each closure device secured in a closed position and the vapor headspace vented to a CD.</p> <p>Owner/operator shall inspect the unit § 264.1085(c)(3) or § 265.1086(c)(3).</p>	

Waste Determination for Treated Wastes 40 CFR § 1084(b): Tanks/Surface Impoundments/Containers

A tank, surface impoundment, or container is exempt from standards specified in § 265.1085 through § 265.1088, ..., provided that the waste management unit is one of the following: A tank, surface impoundment, or container for which the organic content of all the hazardous waste entering the waste management unit has been reduced by an organic destruction or removal process that achieves any one of the following conditions:

CASE 1

The volatile organic concentration at point of waste treatment is less than the exit concentration limit established for the process. [§ 1083(c)(2)(i)]

$$\bar{C} = \frac{1}{Q_T} \cdot \sum Q_i \cdot \bar{C}_i$$

Q_T is the total hw mass quantity during avg period

Q_i is mass quantity of hw stream represented by C_i

C_i measured VO conc of sample i.

C_x represents concentration of streams below 500 ppmw

$$\gamma_i = \frac{\sum Q_x \cdot C_x + \sum Q_y \cdot 500 \text{ ppmw}}{\sum Q_x + \sum Q_y}$$

Q_x represents mass flow of streams below 500 ppmw

Q_y represents mass flow of streams at or above 500 ppmw.

CASE 2

Achieves an organic reduction efficiency "R" 95% and $C < 100 \text{ ppm}_w$ (average volatile organic content) [§ 1083(c)(2)(ii)]

$$R = \frac{E_b - E_a}{E_b} \cdot 100$$

$$E_b = \frac{1}{10^6} \sum Q_{bj} \cdot \bar{C}_{bj}$$

$$E_a = \frac{1}{10^6} \sum Q_{aj} \cdot \bar{C}_{aj}$$

E_a waste volatile organic mass flow exiting process, kg/hr

E_b waste volatile organic mass flow entering process, kg/hr

Q_b mass flow of hw entering process

Q_a mass flow of hw exiting process

CASE 3

Achieves an actual organic mass removal rate "MR" for the process which is equal to or greater than the required organic mass removal rate "RMR". MR RMR [§ 1083(c)(2)(iii)]

$$RMR = \sum [V_y \cdot k_y \cdot \frac{\bar{C}_y - 500 \text{ ppmw}}{10^6}]$$

V_y = average volumetric flow rate of HW stream y, m³/hr.

k_y = density of HW stream y.

\bar{C}_y = average VO conc of HW stream y at point of origination.

CASE 4

Operates through a biological process that destroys and/or degrades organics contained in the hazardous waste through an organic reduction efficiency "R" 95% and the organic biodegradation efficiency R_{bio} 95% [§ 1083(c)(2)(iv)(A)]

$$R_{Bio} = F_{Bio} \cdot 100\%$$

F_{bio} = Fraction of organic biodegraded. This fraction may be calculated according to 40 CFR Part 63, Appendix C.

CASE 5

Operates through a biological process that destroys and/or degrades organics contained in the hazardous waste through an actual organic mass biodegradation rate "MR_{Bio}" which is equal to or greater than the required organic mass removal rate "RMR". MR_{Bio} RMR [§ 1083(c)(2)(iv)(A)]

$$MR_{Bio} = E_b \cdot F_{Bio}$$

E_b has the same meaning as in case 2.

F_{bio} has the same meaning as case 4.

CASE 6

A process that has

1. air emission controls from the point of origination throughout the treatment units (as specified by § 265.1085-1088),
2. is conveyed by a continuous hard-piping or other closed system transfer,
3. Avg VO conc of HW at point of treatment is less than lowest avg VO conc at the point of waste origination for each individual stream, or 500 ppm_w, which ever is lowest. [1083(c)(2)(v)(A-C)]

CASE 7

Organic removal efficiency "R" 95%, AND owner/operator certifies that the average VO conc at point of waste generation for each stream is < 10,000 ppm_w. [1083(c)(2)(vi)]

R has the same meaning as in case 2.

Average VO conc has the same meaning as in case 1.

CASE 8

A hazardous waste **incinerator** for which the owner/operator has been issued a final permit,

OR

Unit is designed and operated in accordance with Subpart O requirements of Part 265. [265.1083(c)(2)(vii)]

CASE 9

A hazardous waste **Boiler or Industrial Furnace** for which the owner/operator has been issued a final permit,

OR

Unit is designed and operated in accordance with Subpart H requirements of Part 266. [265.1083(c)(2)(viii)]

Waste Determination for Treated Wastes 40 CFR § 1084(b): Tanks/Surface Impoundments/Containers

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CASE 10

A tank used for biological treatment of hazardous waste in accordance with 265.1083(c)(2)(iv).

Case 11

A tank, container, surface impoundment where all the hazardous waste meets either:

1. Numerical treatment standards for LDR applicable to constituents,
- OR
2. Treated accordingly by specified treatment technologies to achieve LDR.

Case 12

Tank used for bulk feed of hazardous waste to a waste incinerator, if the tank is within an enclosure, installed before Nov 25, 1996, and was designed per 40 CFR § 52.741.
